

TOOL 7. COSTS AND BENEFITS OF TYPICAL SPECIAL WASTE PROGRAMS

INTRODUCTION

Special wastes of concern in Wyoming include used oil, vehicle batteries, tires, white goods (i.e., large appliances) and asbestos. This Tool will include information on the management of these wastes in Wyoming and will address the costs and benefits of the management programs.

SPECIAL WASTE PROGRAMS IN WYOMING

Used Oil

Used oil is collected at some service stations and city maintenance operations as well as some landfills. The oil is generally stored until sufficient quantities are available for collection and transport to a fuel processing facility where it is cleaned and blended for use as fuel. A cost is sometimes incurred for collection of used oil and may amount to around 10 cents per gallon. However, a survey of some Wyoming locations storing used oil indicates the oil is often collected at no charge.

Vehicle Batteries

Stores selling vehicle batteries in Wyoming must by law take one battery for each one purchased. Some battery dealers will take additional batteries and may, in fact, pay a small amount for a used battery when a new one is purchased. Some landfills and recyclables drop-off centers will accept vehicle batteries as well. The batteries are banned from landfilling in Wyoming and are generally recycled.

Tires

Old tires are usually left with the dealer when new tires are purchased and mounted. However,

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some tires are saved for other uses in which case they must be discarded later. These tires may be taken directly to landfills or other locations that accept them. Separate loads of tires from dealers or drop-off centers are reported as typically stockpiled at a landfill until shredded. Landfills are reported to charge about one dollar per tire.

White Goods (Major Appliances)

Major appliances are sometimes removed by large appliance retailers after the purchase of a new one. However, in more rural areas, a waste hauler will frequently be needed for this service if the appliance does not have remaining value. The appliances may initially be taken to a landfill or scrap dealer. From these locations, they are either collected for recycling or are landfilled. CFCs (freon) must be removed prior to disposal and removal of capacitors or ballasts containing PCBs may be needed as well.

Asbestos

Asbestos waste can be disposed in permitted landfills. Five landfills in Wyoming are permitted to receive friable asbestos whereas non-friable asbestos can be accepted at these or other MSW landfills.

BENEFITS OF DIVERSION PROGRAMS

Diversion from Disposal

Used oil, major appliances, vehicle batteries and tires may be recovered for recycling. In addition, used oil and tires are frequently processed for use as fuel.

Table 7-1 shows levels of recovery of these waste streams nationally. Recovery for recycling is shown for major appliances, tires and vehicle batteries. These are components of MSW and the amounts recovered for recycling are expressed, respectively, in Table 7-1, as a percentage of the

- **Major appliances are sometimes removed by large appliance retailers after the purchase of a new one.**

- **Used oil, major appliances, vehicle batteries and tires may be recovered for recycling**

product generation and as a percentage of total MSW generation. While large fractions of major appliances and vehicle batteries are shown as recovered for recycling, a comparatively small portion of tires are recycled. Recovery of these three MSW products, collectively, is shown at two percent of total MSW generation in 1994.

National recovery of used oil for fuel use and re-refining is also shown in Table 7-1. Re-refining consumes only a small part of recovered used oil; fuel use is by far the largest use of recovered oil. About 78 percent of used oil was recovered nationally in 1993. Although used oil is not classified as MSW, the recovery of used oil shown in Table 7-1 is equivalent to about 1.8 percent of MSW generation.

Resource and Environmental Savings

As noted in Tool 6, savings in both natural resources and the environment are realized with recycling. Tool 6 may be referred to for a discussion of these savings. It should be noted, however, that proper management of the special wastes described above is particularly important in preventing environmental harm. For example, recovery of CFCs from large appliances reduces damage to the protective ozone layer in the atmosphere. Recovery of lead and acid from vehicle batteries also prevents these materials from constituting potential hazards.

Recovery of used oil for use as fuel is beneficial in preserving fossil fuels as well as reducing the potential for water pollution that could occur with land disposal.

COSTS OF SPECIAL WASTE DIVERSION PROGRAMS

Little, if any, cost may be associated with current management of used oil and vehicle batteries in Wyoming. Stores selling vehicle batteries

- **Nationally, recovery of appliances, vehicle batteries and tires were two percent of total MSW generation in 1994.**

- **Savings in both natural resources and the environment are realized with recycling.**

Table 7-1

NATIONAL RECOVERY OF SPECIAL WASTES

	<u>% of Product Generated</u>	<u>% of MSW</u>
Major Appliances (1)	57	0.9
Rubber Tires (1)	15	0.3
Automotive Batteries (1)	94	0.8
Total		2.0
Used Oil (2)	78	1.8

- (1) 1994 estimates of recovery for recycling from Characterization of Municipal Solid Waste in the United States, 1995 Update, prepared for U.S. EPA, March, 1996 by Franklin Associates, Ltd.
- (2) 1993 estimate of recovery for fuel use and re-refining prepared by Franklin Associates, Ltd. Although used oil is not included in MSW, quantity recovered for re-refining and fuel use is presented as percent of MSW generation to illustrate magnitude.

Source: Franklin Associates, Ltd.

sometimes pay for old batteries which suggests the batteries are of value when collected for shipment to a battery recycler.

Those storing used oil are, at least in some instances, not paying for collection and transport of the oil to a fuel processor. If a charge for collection of used oil is levied, ten cents per gallon (about \$27 per ton) is judged as typical. However, the value of the oil when blended into fuel may sometimes be enough to cover the cost of collecting, transporting and processing the oil.

Tires are typically loaded from storage points (such as tire dealers) and hauled to landfills where they are shredded prior to disposal. At a charge of one dollar per car tire and 21 pounds per tire, the disposal cost is \$95 per ton. An estimated average cost of \$25 per ton to collect and haul the tires to a landfill results in a total tire management cost of \$120 per ton.

Management of major appliances is even more expensive. As shown in Table 7-2, substantial costs are usually incurred for collection and transport as well as for removal of freon and PCBs. These costs are generally required whether the appliance is landfilled or recovered for recycling. Most appliances are recycled instead of landfilled since the recyclable steel and other materials typically result in some revenue to offset costs. Despite their recycling value, the net cost of managing major appliances was estimated at over \$300 per ton (about \$25 per appliance).

Asbestos management costs are more difficult to assess. Asbestos may require more careful handling thereby resulting in higher costs than most other landfilled wastes.

OTHER SPECIAL WASTES

Various special wastes in addition to the ones described above may be generated in a specific

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- **Most appliances are recycled instead of landfilled.**

area. These wastes are largely dictated by the types of industries operating in the area and may include various manufacturing wastes, utility wastes, medical wastes, etc. It is important in SWM planning to identify the local industries and the wastes they generate. If such wastes are to be managed off-site, they must be planned for and charges established to cover the costs of the management services required.

**Table 7-2
ESTIMATED APPLIANCE MANAGEMENT SYSTEM COSTS**

	<u>Average Cost Per Appliance (\$)(1)</u>	<u>Average Cost Per Ton (\$)(2)</u>
PCB Management	2.82	35.25
CFC Management	1.88	23.50
Collection/Transport	<u>21.26</u>	<u>265.75</u>
Subtotal	25.96	324.50
Revenue	(1.32)	(16.50)
Net Total Cost	24.64	308.00

- (1) From Discarded Household Appliances: Management and Recycling in Wisconsin prepared for Wisconsin Department of Natural Resources by DPRA Incorporated, St. Paul, MN, Feb., 1992.
(2) Based on 160 pounds per appliance unit average.

Source: Franklin Associates, Ltd.